

## Book Review

### The Birth of Behaviorism: A Review of *From Darwin to Behaviourism: Psychology and the Minds of Animals* by Robert Boakes

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Evolutionary theory, comparative psychology, British empiricism, the reflex—we learn in graduate school that all of these had something to do with the origins of experimental psychology in general and behaviorism in particular. Somehow Watson got tired of introspection and of inferring mental events in animals and so founded behaviorism with his manifesto of 1913. But is this so, and how did it happen?

This book tells the story. It covers a relatively brief period of about 60 or 70 years from the impact of Darwin's *Origin of the Species* in the 1860's to the establishment of behaviorism in the 1920's, just before Skinner came on the scene. The tale is told with thoroughness, care, good humor, and—best of all—with understanding, because the author is no outsider, no professional philosopher or historian, who might tell it with scorn and the misapprehension that behaviorism is dead, but an experimenter who did his graduate work at Harvard during the 1960's when, under Herrnstein, and with Skinner still present, quantitative studies of behavior and the development of modern behaviorism were in full swing.

To anyone interested in behaviorism, pro or con, this book should be required reading. I found it entertaining and provocative from beginning to end. It was many years in the making. I know, be-

cause I saw Boakes in 1977 in Maryland when he was doing some of the research on Watson in Baltimore. It is carefully organized and carefully documented. In short, it is a book to be enjoyed, absorbed, and relied on.

The cast of characters contains many familiar figures—Darwin, James, Watson—but often in entirely new light (at least to me; I am no historian). It contains also many unfamiliar people, often rescued from undeserved obscurity—Spalding, Bechterev, Hamilton, Hobhouse—and they all add to the richness of the telling. The author explains in the preface that he adopted no one historical approach. Sometimes he plays the intellectual historian, describing the development and interplay of ideas; sometimes he plays the biographer, giving the details of a character's life that might make his actions comprehensible; and sometimes he plays economic historian, describing the practical effects of political and administrative developments, particularly the availability of money for experiments and writing. It was a wise decision, because the various points of view add a wholeness to the story, but demand some thought on the reader's part. For example, Lloyd Morgan at the end of his career came up with an account of inheritance and learning in behavior very like the modern one, but the book in which he advanced it, *Habit and Instinct*, sold only about 50 copies in all of Great Britain and the United States. Although Morgan's later views are of interest for intellectual history, the reader has to realize that only his earlier works were influential.

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It may be prejudice, but I liked best the first two chapters, on evolution and comparative psychology. Few psychologists read Herbert Spencer today, but during the period covered by this book, his views were enormously influential. Boakes contrasts him with the independently wealthy, upper-crust, leisurely, and cautious Darwin. Spencer was an upwardly mobile journalist at a time when upward mobility was rare, and he wrote obsessively, churning out prose which eventually became his livelihood. Spencer popularized the ideas of Lamarck, which included not only the inheritance of acquired characteristics, but the thesis that evolution was progressive, proceeded one-dimensionally from simple organisms to more complex to human beings, its ultimate product. So, although it was original with Lamarck, we owe to Spencer the persistence of that pernicious doctrine that divides humankind from "the beasts" and places us, flatteringly, in a superior position. This was never Darwin's view. Although he allowed some Lamarckian inheritance, Darwin visualized evolution as proceeding like a branching tree. Such a view makes every species unique, including human beings, and makes nonsense of the superiority of one species over another; homo sapiens is but one species among the many. Boakes draws well the differences between the Darwinian and Spencerian views of evolution. One reads with frustration the way in which the lack of any clear notion of the mechanisms of inheritance created a muddle of ideas about the methods and aims of psychology that persisted well into the twentieth century and can still be seen in psychology today.

One should not be too hard on Spencer; he had some good ideas, too. Boakes explains how Spencer picked up from the associationist Alexander Bain the distinction between learning by association of an event with a motor act and learning by the consequences of an act. This not only anticipated, but led to the later distinction between classical and instrumental conditioning. When Thorndike proposed the law of effect, he was only

renaming what was already known as the "Spencer-Bain principle."

The second chapter deals primarily with Romanes and Morgan, to whom we owe the idea that comparative psychology is the "junior partner" to introspective human psychology, the idea that behaviorism was to overthrow. Although Romanes was Darwin's chosen successor, Romanes's view of evolution was Spencerian. Perhaps as a result of this, his contribution appears to have been primarily a negative one, because even in his time psychologists and biologists reacted with skepticism to his inferences about consciousness in animals and his uncritical acceptance of anecdotes as evidence. These led Lloyd Morgan to begin the trend toward relying on carefully obtained empirical evidence and to propose his famous canon. Although we are inclined to see Morgan's view as an appeal to a principle of parsimony, Boakes explains that Morgan justified it on the evolutionary grounds that natural selection would favor only the traits minimally necessary for adaptation.

Boakes explains also in these chapters how both religious strictures and the thinking of physicists and geologists about the age of the earth affected the development of comparative psychology. The Bible seemed to require that the earth be young, and for a while scientific evidence seemed to support this. With so little time to operate, it seemed inconceivable that natural selection alone could account for evolution, hence the popularity of Lamarckian inheritance, which offered the speed that seemed to be required. Hence also, then, the popularity of the Spencerian view. Eventually, estimates of the age of the earth grew, and with them grew the plausibility of Darwin's view, too late, however, to prevent Spencer's view from becoming entrenched.

The third chapter appears to rely heavily on secondary sources, but gives a fresh and clear picture of the way that experimental psychology of the late nineteenth century contributed to the rise of behaviorism. It starts with figures such as Wundt and Helmholtz and takes us up

to Thorndike. Boakes makes a number of remarkable points here. First, he explains that the history of experimental psychology, and particularly animal psychology, was profoundly affected by the history of the university as an administrative structure during this period. German universities were reformed during the first half of the nineteenth century, in accordance with two new radical ideas: academic freedom for scholars and the notion that a university should not only be responsible for the transmission of knowledge, but also for its accumulation. American universities as we now know them were based on a modified version of the pattern established in Germany, and were born primarily of the efforts of just one man, Daniel Gilman, the first president of Johns Hopkins. To these developments mainly we owe not only our present vision of the professor as teacher and researcher, but also the inclusion within the university of scientific research in general, experimental psychology in particular, and more particularly still, animal psychology. Boakes explains the crucial role played at this juncture by G. Stanley Hall, who was invited by Gilman to Johns Hopkins. Hall's efforts there, and later at Clark, established experimental animal psychology and set the scene for it to be imported later to Chicago, where Watson received his training.

Second, the pictures Boakes paints of James and Thorndike I found particularly illuminating. James is a bit of a mystery because he had so much influence on experimental psychology, even though he was no experimentalist himself. It seems that James had only a passing affair with psychology. He only wrote the *Principles* to set his ideas down and set psychology straight. Established psychologists did not think much of the book, but because it was the only usable textbook around, almost everybody used it, with the result that a whole generation of new psychologists grew up on it. James was brilliant and impressive, and argued in favor of experimentation. He encouraged Thorndike in his efforts to do the

first experiments on learning in animals that approached modern standards of care. The rigor of Thorndike's work largely figured in the setting of that standard. Surprisingly, beyond this, Thorndike contributed little to the rise of behaviorism; he stuck to the idea that psychology should study consciousness and his interests took him off to the field of education.

Chapters 4 and 5 deal with reflexes. Boakes begins with Descartes and traces developments up through Pavlov and Bechterev. His discussion of La Mettrie and Hartley I found especially illuminating. These two published mechanistic accounts of human behavior within a year of one another (1748 and 1749). The substance of what they had to say was just about the same, that human behavior could be understood as the workings of a complicated machine, without reference to any free will. La Mettrie, however, was persecuted for his ideas, whereas Hartley was left alone, for reasons that appear to lie in their mode of presentation. La Mettrie went out of his way to antagonize the religious society around him by expressing the idea and its implications clearly and forcefully, whereas Hartley wrote in such a boring style that few enough people bothered to get what he was driving at.

Hartley's ideas eventually did enjoy the consideration they deserved, even though he himself may have had little to do with it because this development began about a century later in Russia. Boakes gives a marvellous picture of Sechenov and his place in the tumultuous history of Russia in his time. This is followed by a unique picture of Pavlov, his life, and his work, apparently pieced together not only from secondary sources but also from archival material. We get an account of the early life and work of this indefatigable and exacting experimenter, of his early poverty and his later success, and then an analysis of why and how Pavlov pursued his interest in conditioning. It didn't happen all at once, the way textbooks seem to suggest, but over a period of time. Pavlov, the physiologist, established, re-

spected, and well-funded, turned his laboratory gradually to investigation of the new phenomena. Pavlov, because he was established and well-funded, was in a position to do what no one else could do—to study animal psychology.

Boakes seems to argue, however, that Pavlov's influence on American psychology may have been less, or at least different from, what is usually accepted. If anything, we may owe more to Bechterev. Boakes describes the great quarrels and animosity between Pavlov and Bechterev. No doubt Pavlov was the better scientist, but Bechterev was more forthright about setting his ideas before the public. In his book, *Objective Psychology*, Bechterev argued against introspection as a method for psychology and in favor of the study of behavior. Pavlov eventually reluctantly came to agree. Boakes argues in a later chapter that Bechterev's book was read with interest in the United States before Pavlov's work, and when Pavlov's book, *Conditioned Reflexes*, was finally translated, it was readily absorbed into the existing mainstream of thought in American psychology with little ado—and that even comes at the very end of the period with which this book deals.

Chapter 6 constitutes the climax of the story. It is rich with detail about the status of comparative psychology and the debates about the goals of comparative psychology around the turn of the century, and it leads up to Watson and his manifesto of 1913. The chapter opens with a treatment of the debate between Loeb and Jennings about how to interpret the behavior of microorganisms. Loeb argued for describing behavior by simple laws like those of chemistry and physics. Jennings never actually ascribed consciousness to one-celled organisms, but he argued that it might be useful to do so and that the behavior even of paramecia and amoebae is too complicated to be reduced to the simple principles advocated by Loeb. This kind of dispute, between supporters of simplicity and rigor, on the one hand, and supporters of complexity and correspondence to the "real" world (i.e., external validity), on the other, has occurred again and again

in the history of psychology—associationism versus Gestaltism, Hull versus Tolman, and so on. We see a dispute today between behaviorists and cognitive psychologists. Perhaps this is a sign of health; each side keeps the other from going astray.

Boakes's account of Watson's early career provides many details that make his behavior more comprehensible and place him in the context of American psychology at the time, which is described in broad terms. The whole is interesting and highly readable. The introduction of the rat as a laboratory animal at this time appears to have helped determine the direction of Watson's research and thinking. His collaboration with Yerkes appears to have influenced his direction, mainly through their disagreements.

The only weakness I found in this chapter was in the treatment of Watson's manifesto of 1913. Boakes refers to the usual two points that are drawn from the paper: the argument against introspection as a method and the emphasis on practical goals for psychology that will ensue from prediction and control of behavior. He says nothing about Watson's discussion of the relationship between psychology and evolution or about Watson's inclusion of instinct in his suggestions about how to analyze behavior. Watson's views moved over a period of years to radical environmentalism and a Spencerian reading of evolution. Boakes makes this clear in the last chapter, and Logue (in press-a, in press-b), in work that Boakes cites, spells it out even more clearly. But in the 1913 paper itself, one finds Watson open to the ideas that much behavior may be inherited, that our species is but one among the many, and that only by studying behavior in general, in many species, can we hope to gain a good understanding of human behavior. Darwin would have agreed. Boakes's statement that Watson "believed that nothing was to be gained from trying to place psychology within some evolutionary context" (p. 172) seems inconsistent with Watson's discussion of evolution in the manifesto. This at least is my reading of the paper.

Boakes's reading may differ from mine because he views it by hindsight, knowing what came after, or, more likely, because he aims to place Watson historically in the context of the events of his time. Watson, Boakes explains, was by no means isolated or acting on his own. Circumstances determined that a whole group of behaviorally oriented psychologists were at Johns Hopkins at this time; besides Watson, this included Jennings, Meyer, and Lashley. They apparently had a lot to do with one another. One gets the impression of an enthusiastic group, stimulating the thinking of all its members. Frustratingly, Boakes finds that few records exist of what went on, but when Watson wrote of the "behavior men," he had something concrete in mind.

The last two chapters are in keeping with the rest of the book. Chapter 7 takes up the beginnings of primate research, the effects of Gestalt psychology, and attitudes toward the problem of purpose. The last chapter, on nature and nurture, deals with events up to about 1930. It discusses McDougall, Kuo, Watson's later career, Tolman, and Hull. The reader

finds at the end that the stage is set for Skinner's appearance and that all the problems behaviorists struggle with today, from the nature of learning and instinct to purpose and verbal behavior, have been anticipated.

I cannot say what historians will think of this book. It appears to me to contain a lot of original work, judging from the number of archival sources cited. It contains also a number of remarkable photographs of people and apparatus that add greatly to its impact. To any psychologist or biologist interested in comparing animal and human behavior, I highly recommend it. I learned a great deal by reading it, and I expect to refer back to it often in the future.

#### REFERENCES

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